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ABSTRACT

In recent years it has become apparent that the system of continuing medical education developed in the USSR has reached a high level of achievement. At the invitation of the Ministry of Health of the USSR, an international study tour was organized by the World Health Organization to study the Soviet system. This report presents the findings of that tour group. The first section deals with the administration and staffing of health services in the USSR, including the organization of the public health services. The second section addresses itself to medical education, including undergraduate education, specialist postgraduate education and advanced postgraduate education. Section 3 describes the 2 institutes for advanced medical studies in the USSR, and the fourth section explores the various types of course offerings within the institutions. The fifth and final section is involved with the advanced training of special groups, such as medical teaching staff, public health administrators and paramedical personnel. (HS)

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PUBLIC HEALTH PAPERS

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POSTGRADUATE EDUCATION
FOR MEDICAL PERSONNEL
IN THE USSR

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PUBLIC HEALTH PAPERS
No. 39

POSTGRADUATE EDUCATION
FOR MEDICAL PERSONNEL IN THE USSR

POSTGRADUATE EDUCATION FOR MEDICAL PERSONNEL IN THE USSR

*Report prepared by the Participants
in a Study Tour organized by the World Health Organization*

WORLD HEALTH ORGANIZATION
GENEVA

1970

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PREFACE

In recent years it has become apparent that the system of continuing medical education developed in the USSR has reached a high level of achievement. At the invitation of the Ministry of Health of the USSR, an international study tour was organized by WHO to study the Soviet system at first hand.

The tour lasted from 8 to 31 October 1968, and the 18 participants from 17 countries consisted mainly of teachers and health administrators concerned with medical education. A list of the participants is given in Annex 1 (page 46). The tour was led by Professor V. S. Pogosov of the Central Institute for Advanced Medical Studies, Moscow, on behalf of the Ministry of Health of the USSR, and by Dr J. A. Deeny on behalf of WHO. Much assistance with the organization and day-to-day running of the tour was given by Dr V. A. Alekseev of the Central Institute for Advanced Medical Studies, Moscow, and Dr V. N. Butrov, a WHO Consultant.

The tour began in Moscow with a number of lectures and discussions on the health services and the medical training system in the USSR. The participants next spent a week in Tashkent, capital of the Uzbek Soviet Socialist Republic, making a thorough study of continuing medical education at the level of a constituent Republic of the USSR. They visited medical training establishments, hospitals, and health centres. One day was spent in Samarkand, where a visit was paid to the medical institute. The group then travelled to Sukhumi, capital of the Autonomous Republic of Abkhazia within the Georgian Soviet Socialist Republic, to study advanced medical training in a comparatively small administrative unit. For the last week of the study tour the participants returned to Moscow to make a number of visits to educational establishments, listen to further lectures, and discuss what they had learned both with USSR colleagues and among themselves.

INTRODUCTION

During the last 20 years the concept of continuing medical education has become increasingly important for health workers all over the world. Practitioners who wish to improve their knowledge and skill, public health administrators who wish to form new cadres for new tasks requiring new skills, and government health departments wishing to improve the performance of personnel in national health services have all shown a growing interest in refresher courses and other forms of continuing medical education.

This interest has become accentuated in the last decade, for the difficulty of keeping abreast with the rapid advances in medical sciences has made it necessary to find ways of applying new scientific discoveries to everyday practice. Many new discoveries in related branches of science may also enrich medicine, adding to the physician's ability to treat and prevent disease, to improve people's health, and to prolong their lives.

Continuing medical education is also necessary because of the expansion of medicine and the sheer impossibility of including all that a doctor needs to know in the undergraduate course. The term "refresher course" in this context is inadequate, since such training must include material that the doctor did not learn as an undergraduate. This applies to such developing and expanding fields as cardiac surgery, where an experienced surgeon needs to learn new techniques.

In the light of rapid advances in medicine and in related scientific fields, much that a physician learns in medical school soon becomes obsolete. It is essential not only that he should continue to learn, to develop professionally, and to become increasingly skilful and knowledgeable, but also that he should be provided with the means to achieve this.

Numerous expert committees and scientific groups convened by WHO have stressed the need for refresher courses and other forms of continuing medical education. In 1956, a WHO Study Group on Paedia-

tric Education stated: "All physicians, whether they are in general or paediatric practice, require opportunities for bringing their knowledge up to date".¹ The Group discussed in great detail the ways in which this could be achieved.

The WHO Expert Committee on Professional and Technical Education of Medical and Auxiliary Personnel has repeatedly made similar recommendations. The Committee's third report pointed out: "It is obviously necessary to provide at all times for maintenance of the skills and knowledge of auxiliary workers. This is best done ... by regular refresher courses."² The eighth report³ recommended a scheme for training teachers of the basic sciences, emphasizing the need for international co-operation in the organization and selection of centres, while the ninth report⁴ advocated regular assessment of the work of all auxiliary personnel and the provision of refresher courses based on the needs indicated by the assessment.

Many countries have already devised or are considering schemes for further medical education, and universities, medical schools, medical associations, and governments are becoming increasingly interested in this aspect of training.

DEFINITIONS

A number of terms used in this publication relate specifically to the Soviet system of health services and medical education, and are defined below:

Učastok

This is a territorial unit served by a doctor. The *učastok* of a general therapist (general practitioner) contains about 4000 persons. A gynaecologist's *učastok* may comprise 3000 women, and a paediatrician's 800-1000 children. Patients may choose an *učastok* at their place of work, rather than near their residence.

Sanepid station

This sanitary and epidemiological centre corresponds to the health office or department of a medical officer of health. It provides public health services, including communicable disease control, environmental hygiene, and public health laboratory services. A sanepid may serve from 30 000 to 2 million people.

¹ *Wld Hlth Org. techn. Rep. Ser.*, 1957, No. 119, p. 15.

² *Wld Hlth Org. techn. Rep. Ser.*, 1956, No. 109, p. 17.

³ *Wld Hlth Org. techn. Rep. Ser.*, 1961, No. 209.

⁴ *Wld Hlth Org. techn. Rep. Ser.*, 1961, No. 212.

Feldsher

The highest grade of medical auxiliary worker in the USSR, who works under the direct supervision of fully qualified medical staff. Feldshers may be general, sanitarian, or laboratory workers. The general feldsher corresponds to a medical assistant in some countries. The feldsher sanitarian performs the same duties as a health inspector or sanitarian. The laboratory feldsher is somewhat below the level of the laboratory technician in other countries, but with further training may attain this level. A proportion of feldshers may, after some experience, commence medical studies and qualify as doctors.

Medical school

A school for medical auxiliaries, such as feldshers, midwives, and nurses. For candidates with 8 years of schooling, the training course for feldshers and midwives lasts 3 ½ years, the course for nurses 2 years and 10 months. For candidates with 10 years of schooling (full secondary education), the courses last 2 ½ years and 22 months respectively. The nursing course is largely practical.

Medical institute

An independent higher educational establishment, distinct from a medical faculty of a university, for the training of doctors.

Clinical ordinatura

See page 16.

Aspirantura

See page 17.

Theoretical department

Broadly, a department of a medical institute or an institute for advanced medical studies, dealing with basic science and with such medical fields as immunology and human genetics.

Clinical department

A department dealing with patient care.

Doctor

Strictly, a medical practitioner holding the degree of Doctor of Medical Sciences, the senior medical qualification obtained after defending a doctoral thesis. In this publication, however, the term is used in a broader sense, and refers to all medical practitioners, regardless of their level of postgraduate training.

ADMINISTRATION AND STAFFING OF HEALTH SERVICES IN THE USSR

The USSR consists of 15 Union republics, each of which has a supreme soviet (headed by a chairman), a council of ministers, and a parliament. These constituent republics are divided for administrative purposes into 105 oblasts and 6 krajs (oblasts with a large area), the population of which may range from half a million to several million people. These are further subdivided into over 4500 rayons — urban or rural areas sufficiently large to form a locally elected administration. Within the rural rayons there are some 40 000 rural districts, most of which comprise several settlements, such as villages or State or collective farms.

The Union republics also contain 20 autonomous republics, 8 autonomous oblasts, and 10 national okrugs — administrative entities based on the presence of a large concentration of a particular national or ethnic group.

ORGANIZATION OF PUBLIC HEALTH

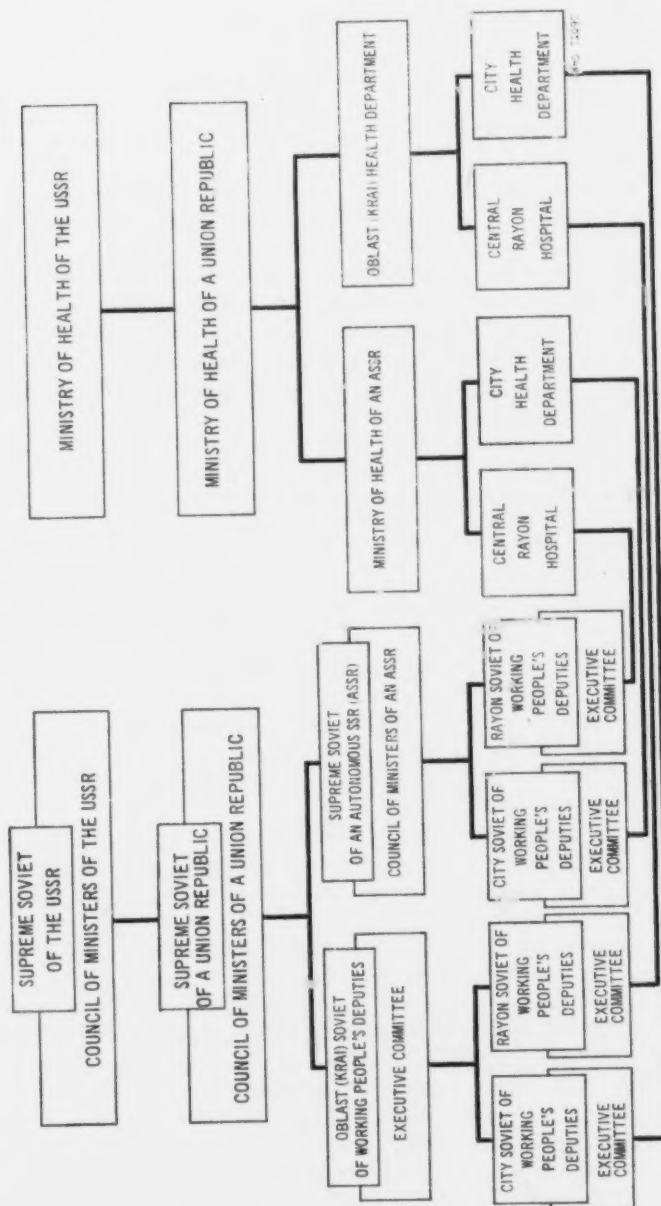
The Soviet health services are based on the following principles:

- (1) emphasis on prevention;
- (2) free and universally accessible medical care of high standard;
- (3) close links between medical research and practice;
- (4) participation of the people themselves in developing the public health system; and
- (5) dissemination of knowledge of hygiene among the population.

The structure of public health administration is outlined in the accompanying chart. The central authority responsible for the operation of the public health services is the Ministry of Health of the USSR. The tasks of this Ministry include:

- (1) assessing the state of health of the people;

STRUCTURE OF PUBLIC HEALTH ADMINISTRATION IN THE USSR



- (2) planning and organizing nationwide measures to protect and strengthen the people's health;
- (3) drawing up national standards for hygiene and national regulations for the provision of sanitary and epidemiological services;
- (4) co-ordinating and implementing preventive and epidemic control measures;
- (5) planning, co-ordinating, and guiding scientific and research work in the field of medicine, and implementing the findings of medical and related sciences (biology, physics, chemistry, genetics, etc.);
- (6) organizing and guiding the training, specialization, and advanced training of medical practitioners and paramedical workers;
- (7) studying and determining the population's requirements as to medical care, medical equipment, and other medical and pharmaceutical facilities necessary for the care of patients, and ensuring that these requirements are met throughout the country;
- (8) approving a State pharmacopoeia;
- (9) maintaining liaison with WHO and undertaking scientific and technical co-operation with other countries.

The exercising of central control by the Ministry of Health of the USSR ensures:

- (1) that the central and local health organizations have common interests;
- (2) that uniform organizational principles and standards apply to the rural and urban populations;
- (3) that the public health service is in line with the economic programme of central and local authorities.

Manpower planning

Public health planning in the USSR is conducted on a nationwide basis, which makes it possible to balance requirements in the medical and sanitary services with the resources necessary for meeting them. Public health planning is an inseparable part of over-all national planning, and is closely concerned with social hygiene, public health administration, and the economics of public health.

In 1967, medical and health personnel in the USSR totalled 4 560 000, of whom 598 000 were doctors, or 25.3 per 10 000 population, and 1 861 000 were paramedical workers, or 78.6 per 10 000 population.

The long-range personnel requirements for the adequate staffing of medical and sanitary institutions and for the undertaking of individual measures are determined on the basis of the following factors:

- (1) the prospects for the economic and cultural development of Union republics, individual districts, territories, regions;

(2) the expected size of the population; its composition by age, sex, and occupation; the cultural level and territorial distribution of the urban and rural population;

(3) the incidence of disease; its level and pattern; the socio-economic problems of individuals in the planning period;

(4) medical science, its state of progress and the range of subjects it covers; the extent of specialization of medical services;

(5) the manner in which medical services and the work of medical personnel are organized;

(6) the anticipated requirements of the population for different types of medical and preventive services and sanitary and hygiene services, and the standards used for planning by individual departments of public health;

(7) the work quotas of medical personnel, i.e., number of visits by patients, services to patients in medical institutions;

(8) the quotas of working time established for medical personnel;

(9) the staff quotas at medical and sanitary institutions, etc.

The process of determining the staffing and training requirements of an individual territory, oblast, or republic and for the country as a whole comprises the following stages:

(1) study of the level and pattern of the incidence and prevalence of various diseases, demographic indicators and establishment of the principles and trends involved: investigations of the extent of coverage of the population by medical and sanitary services, the function and standard of public health institutions, the availability, placement, and allocation of medical personnel, the availability and training standards of teaching staff;

(2) elaboration of forecasts of demographic trends: the level and pattern of incidence, the growth of population, shifts in the population's age and sex pattern, urban and rural distribution of the population, housing conditions in a given territory, etc;

(3) elaboration of the main trends and specific objectives in a public health plan for a given period;

(4) determination of standards and quotas for the medical and sanitary services and for specialized medical assistance; expert appraisal of the extent to which requirements for medical services are met; determination of standards for planning posts for doctors and paramedical personnel;

(5) determination of the number of posts for doctors and paramedical personnel required in public health institutions; the determination of over-all personnel requirements;

(6) determination of the rate at which doctors and paramedical workers withdraw from the profession;

(7) determination of the number of additional doctors and paramedical workers required;

(8) determination of the percentage of drop-outs from medical education by years of study and by specialty;

(9) compilation of long-range and annual plans for the training of doctors and paramedical workers for a given administrative area, adjusted and balanced against all other sections of the public health plan;

(10) supervision to ensure that the assumptions on which the plan is based are accurate; adjustments to the plan during its operation to allow for specialists who withdraw from professional work, the drop-out of students, etc.

Three main factors determine medical personnel requirements:

(1) the organizational forms of medical and sanitary services, and the management of the work of medical personnel;

(2) the standard requirements of the population as regards medical and sanitary services (out-patient, hospital, sanatorium, and sanepid services, services for children, etc.);

(3) the work quotas of medical personnel as regards the examination and treatment of patients.

MEDICAL EDUCATION

All types of education in the USSR have in common a State structure, a planned development, the availability to everyone of free education, the granting of scholarships to students, and the guarantee of employment on completion of training.

In order to ensure continuity in the teaching process, medical education is divided into three interdependent stages:

- (1) the undergraduate period, when the student is not only taught the knowledge and skills basic to his profession but is constantly encouraged to deepen and expand his knowledge;
- (2) the period of specialization, when the doctor acquires the theoretical knowledge and practical skills he needs in a certain specialized field; and
- (3) the period of further training, or advanced training, the aim of which is to keep doctors up to date and improve their knowledge and skill.

UNDERGRADUATE EDUCATION

There are at present 77 medical institutes in the USSR and 9 medical faculties at universities. Many of the institutes have faculties of stomatology and pharmacy, and there are also 5 pharmaceutical institutes. Students number some 250 000, and over 30 000 doctors, stomatologists, and pharmacists graduate each year. The duration of studies is 6 years for medical students, 5 years for stomatology students, and 4½ years for pharmacy students.

All medical and pharmaceutical institutes are financed by the State. Apart from 9 medical institutes that are under the direct authority of the Ministry of Health of the USSR, all institutes are under the ministries of health of the republics where they are located. The Ministry of Health of the USSR provides general guidance on the curriculum, teaching

methods, and organization of all medical institutes, and is responsible for planning the network of educational establishments in the USSR as a whole and in the individual republics.

The USSR Ministry of Higher and Special Secondary Education decides on the general educational and social subjects included in the curricula of the medical institutes. It has the right to establish general and organizational standards for all higher and secondary educational establishments.

Academic programmes are the same for all medical institutes, and are approved and issued by the Ministry of Health of the USSR. However, this does not mean that there is no scope for initiative on the part of scientists and teachers at the institutes, some of whom may also be associated with central planning activities.

Medical training in the USSR is specialized: the institutes train students as general medical practitioners, as paediatricians, or as hygiene specialists. The course is identical for all students for the first two years when they receive general biological and social training in normal anatomy, histology, biology, different branches of chemistry, physics, and normal physiology, as well as social and economic subjects and a foreign language (English, French, or German). The third year of studies forms a link between the theoretical pre-clinical subjects and the practical medical subjects. At this stage the students study morbid anatomy, morbid physiology, pharmacology, and microbiology. Clinical subjects, internal diseases, and general surgery are introduced in the third year.

The main clinical subjects — special therapy, special surgery, obstetrics and gynaecology, paediatrics, infectious diseases, psychiatry, diseases of the nervous system, etc. — are studied in the fourth, fifth, and sixth years.

The courses given by the different faculties begin to diverge in the third year. New subjects specific to the faculty concerned are introduced, and the content of other subjects is adjusted.

In the paediatric faculty, for instance, the curriculum includes some subjects that are not taught in the faculty of internal (general) medicine: children's diseases, child surgery, therapeutic and preventive aid for mothers and children, etc. Special attention is given to the study of age or developmental pathology and to the physiology of children.

The faculties of hygiene teach special subjects such as communal hygiene, food hygiene, hygiene of labour, occupational hygiene, and adolescent and child hygiene. In the teaching of subjects also studied in the therapeutic faculty, attention is paid to questions of etiology and pathogenesis, the role of environmental factors as causes of disease, and the significance of sanitary and hygienic conditions in the prevention of diseases.

However, whatever the faculty, attention is always paid in the teaching of clinical subjects to questions of prevention and to environmental conditions. This reflects the main doctrine of Soviet medicine: its emphasis on prevention.

At the end of each year, students at medical institutes must undergo in-service training at therapeutic and preventive establishments under the supervision of the institute's teaching staff. At the end of the third year, students practise for four weeks at hospitals and polyclinics as secondary medical personnel, and after the fourth year they work as assistant doctors, again for four weeks. On completing the fifth year, students work under supervision for two months as *učastok* therapists, paediatricians, or hygiene specialists, depending on their faculty. During this in-service training students consolidate the theoretical and practical knowledge they receive during their college studies.

Medical education at the institute ends with a State examination. Successful candidates receive a diploma appropriate to the faculty in which they studied.

The Ministry of Health of the USSR is at present reorganizing the system of undergraduate medical education. A system of two years' specialization has been introduced experimentally at four medical institutes. The curricula of these institutes have been changed so that the student will have completed the programme of study by the end of five years. The sixth year will then be free for sub-*ordinatura* specialization (see page 20).

This specialization will be carried out under the guidance of professors and their assistants. After completing the sixth year, the student will take the State examinations and will be assigned to a therapeutic and preventive establishment. He will not join this establishment immediately, however, but will be sent for one year's further specialization (internship) to a large oblast and city hospital, to work under experienced specialists. During this second year of specialization the doctor will be given more independence than during the sixth year at the teaching institute. He will have to carry out all the practical functions of a doctor, but under the supervision of experienced specialists.

Upon finishing the internship, the doctor will take further State examinations in his specialty. If successful, he will receive a specialist's certificate and start work in the establishment to which he was assigned on completing his course at the medical institute.

SPECIALIST POSTGRADUATE EDUCATION

For the time being, however, further specialization is normally undertaken after graduation from the medical institute. The physician

qualified in general medicine may specialize in therapy, surgery, gynaecology, etc. The young paediatrician can specialize as a children's surgeon, children's otolaryngologist, children's neurologist, etc. Medical graduates are usually sent for specialist training during their first year of practice.

This specialist training is carried out mainly at large curative and prophylactic establishments in each republic, kraj, oblast, and rayon. The training is given by the most highly qualified specialists in these establishments on the basis of uniform syllabuses approved by the Ministry of Health of the USSR. Attention is devoted mainly to the development of the practical skills and special techniques needed by a doctor in the specialty concerned. Each specialist teacher is entrusted with the training of a maximum of three doctors at any one time. Special training courses last 1-4 months. At the end of the training period, candidates who pass an examination before a specialist board are awarded a certificate attesting that they have completed the required training in the specialty concerned.

In addition to specialist training in local centres, which is carried out on an individual basis, courses of training in some narrow specialties are given at institutes for advanced medical studies and at faculties for advanced medical studies attached to medical institutes.

There are also other forms of specialist training: *ordinatura* and *aspirantura*. The *ordinatura* system has been in use for many years and its aim is to train clinical specialists at a higher level, such as therapists, surgeons, paediatricians, obstetricians and gynaecologists, and neurologists. Clinical *ordinatura* courses are also used for training clinicians in narrower specialties, e.g., ophthalmology, otolaryngology, urology, radiology, neurosurgery, and anaesthesiology. There has lately been a growing demand for specialists in new branches of clinical medicine, such as cardiology, gastroenterology, haematology, nephrology, endocrinology, and medical parasitology, who are also trained through the clinical *ordinatura* system.

Ordinatura training, which lasts for two years, is given at medical institutes, institutes for advanced medical studies, clinical scientific-research institutes, and in certain large hospitals.

Candidates for *ordinatura* courses, who must not be more than 35 years of age, are usually selected while working at city, rayon, or oblast hospitals or at polyclinics. On completion of training they return to their previous employment, but may subsequently be promoted.

Ordinatura training is designed principally for young doctors with two years' seniority, but physicians who have worked for three or more years after graduating from a medical institute and who have undergone primary specialization in a particular field are also eligible to apply for

ordinatura courses. For instance, a physician who has worked for three or more years after undergoing 4-6 months' primary specialization as a general medical practitioner at a large hospital can be enrolled for clinical *ordinatura* training, specializing in internal medicine.

The two years of *ordinatura* training will enable him to move up to a higher post as head of a therapeutics department in a medium-sized hospital or polyclinic, or to work as an intern at a large hospital.

The clinical *ordinatura* course entails intensive study and training, and follows a definite programme. During the course, the physician is a full member of the staff of the training establishment. The training consists mainly of practical work in the departments, wards, operating rooms, bandaging rooms, and the treatment and diagnostic laboratories. In addition, the physician must read widely, undertake reviews, attend theoretical lectures in other departments, and attend conferences, symposia, section meetings, and conventions.

At the end of the course, after a summing-up interview to determine the level of the physician's skills and knowledge, recommendations are given as to his future work.

Aspirantura training is offered to talented young doctors who have distinguished themselves during their undergraduate study or during the practical work of their postgraduate course. Candidates are examined in open competition, in their chosen specialty, a foreign language, and social sciences. The number of candidates accepted at each institute is decided in accordance with the general plan for training specialists and teachers in each field of medicine.

In the normal course, the physician works for three years in a clinic or laboratory under the direct guidance of a scientific counsellor. Physicians may also take the *aspirantura* by a 4-year correspondence course. They do not leave their posts, but visit the appropriate department at the institute for consultations on how to conduct their work.

During his *aspirantura* studies the physician must master thoroughly his chosen specialty and the techniques of conducting scientific research, and must learn teaching methods. At the same time, under the guidance of his scientific counsellor, he carries on research for the degree of Candidate of Medical Sciences. To obtain this degree he must successfully defend a thesis based on original work.

The *aspirantura* student is entitled to use such equipment, classrooms, and laboratories as he may require, to participate in operations, and to treat patients whose conditions are related to his subject.

When the student has completed the course he is not lost sight of. He may be transferred to another, more suitable position. His further development is guided, and individual plans are worked out to help him, especially in his independent investigations.

There is a great degree of flexibility in this process, reflecting the link between theory and practice that is a principle of Soviet medicine. Thus graduates in clinical medicine may carry out their investigations in theoretical departments or may take their whole *aspirantura* course in a theoretical department and return to their permanent practical work and research in clinical medicine.

The *aspirantura* courses in basic sciences and other theoretical fields at medical institutes, together with the courses at institutes for advanced medical studies and at scientific research institutes, are the basic form of training for research workers in the various fields of scientific medicine.

ADVANCED POSTGRADUATE EDUCATION

Advanced (or further) medical training is governed by a number of principles:

(1) *Public responsibility.* The State recognizes that the level of theoretical knowledge and the working capacity of doctors and other workers in the health field are of national importance, and must be regarded as a public responsibility. Accordingly, an immense organization has been created to provide for advanced medical education; large staffs of teachers are employed in many specialized training institutions, many different forms of training are offered, and the entire cost is met by the State.

(2) *Constant growth and development of the individual.* Each person engaged in the health field must be assisted to achieve his maximum potential in his profession. Efforts are made to promote job satisfaction, high morale, and professional interest.

(3) *Relationship to national health planning.* Advanced medical education is closely related to national health planning and provides the manpower necessary to operate the services planned. While the individual's choice of specialty is respected, the training system ensures both that staff will be available to fill new or vacant posts and that posts can be provided for personnel completing their training.

(4) *Comprehensive nature.* Further medical education extends to every worker in the health field. Training is more or less obligatory; in rural areas each health worker attends a course every three years, in urban areas every five years. They receive their salaries while absent from their posts, and all expenses are paid by the State. The range of courses offered covers 76 specialties, and training is given at special institutes, hospitals, research centres, or at centres near to the trainee's home station. A complete and comprehensive programme is provided by a wide range of forms of instruction: individual tuition; correspondence courses

followed by instruction at institutes or hospitals; instruction by visiting teams; and short group courses at centres.

(5) *Integration.* An integrated system of advanced medical education has been established by creating 13 institutes for advanced medical studies that act as organizing and co-ordinating authorities. These institutes unite a large number of institutions and hospitals suitable for continuing medical instruction, establish teaching Chairs, and organize the selection and attendance of trainees.

(6) *Organization.* Medical education should be regarded as a continuous process, commencing with undergraduate education, advancing through specialization, and continuing in a systematic manner throughout life. It should be related on the one hand to scientific progress in medicine, and on the other to the individual, his professional interests and tasks, thus enabling him to give of his best to the community. To make this possible, continuing education is carefully planned and organized, and high standards are ensured by means of research and evaluation.

All doctors with at least five years' seniority undergo advanced education. At present doctors working in rural areas are sent for further training every three years, those working in cities every five years. These are minimum requirements, however: the system is flexible and is adjusted to the needs of the individual as well as to those of health services. The further training of physicians in the USSR is conducted at 13 State institutes for advanced medical studies, 14 faculties of advanced studies at medical institutes, and three faculties for the advanced training of pharmacists, as well as in a national network of local centres for special training attached to large hospitals and sanepid stations. An average of 50 000 doctors undergo further training each year, 75% of them at institutes and faculties for advanced medical studies and 25% at therapeutic and preventive establishments.

INSTITUTES FOR ADVANCED MEDICAL STUDIES

The Central Institute for Advanced Medical Studies is in Moscow, and the other State institutes for advanced medical studies are at Leningrad, Kiev, Kharkov, Kazan, Novokuznetsk, Tbilisi, Tashkent, Zaporozhe, Baku, Minsk, Alma-Ata, and Erevan. To illustrate the work of these establishments, those at Moscow and Tashkent are described in the following sections.

CENTRAL INSTITUTE FOR ADVANCED MEDICAL STUDIES, MOSCOW

This Institute, which was founded in 1930, has 65 Chairs, with 77 professors, 115 docents, and 229 lecturers. There are five faculties: surgery, internal medicine, biological medicine, sanitation and hygiene, and paediatrics. The Institute is headed by a Rector and four Pro-Rectors, one of whom is Deputy Rector.

The Institute is administered by the Ministry of Health of the USSR, and has a special unit for liaison with the Ministry. It is used by the Ministry for experimental or advisory services, such as the preparation of model curricula. The Institute's annual budget is approximately 4.6 million roubles, paid by direct grant from the Ministry of Health. While most of the departments in the faculties of sanitation and hygiene and biological medicine are situated in the Institute proper, the departments in the other faculties are located elsewhere, such as the S.P. Botkin Moscow City Clinical Hospital, which is the Institute's main base. The Institute also has access to other large hospitals and clinical institutes, with a total of more than 9000 beds. The "theoretical" and research departments are situated in special buildings belonging to the Institute, which are fully equipped for training and research. The five radiological departments have a special building equipped with cobalt units, linear accelerators, and other such apparatus. The Sanitation and Hygiene Faculty is closely associated with the Moscow City Sani-

tary and Epidemiological Service. The Institute has a library with a quarter of a million books. It has a publishing department and provides full bibliographic and other facilities.

The doctors who undergo training at the Central Institute are usually senior health staff, such as (a) chiefs of major public health units (of republics, territories, regions, and large cities); (b) professors or docents at medical educational establishments (medical institutes and institutes for advanced medical studies); (c) chief specialists (surgeons, therapists, paediatricians, etc.); (d) chief physicians of large hospitals or hospital departments; and (e) chief physicians of sanepid stations.

The Institute is also responsible for training young scientific workers and instructors for higher medical establishments (through *aspirantura* courses) and junior physicians for higher posts (through clinical *ordinatura* courses). Every year more than 500 graduates undergo *aspirantura* and *ordinatura* training at the Institute. About 1500 young scientists and clinicians destined for higher posts have been trained in the last 15 years.

In 1965 more than 10 000 doctors received training through the Institute. As the number is constantly increasing, it was expected that a further 60 000 doctors would take courses between 1966 and 1970. They were planned to comprise 9500 chiefs of public health services and medical establishments, 22 600 chiefs of departments and branches of health service establishments, 6850 instructors at medical institutes for advanced medical studies, and workers in research institutes, and 21 050 interns at medical prophylactic establishments and sanepid stations. The two hundred thousandth diploma for further training was conferred in 1968.

At the request of the Ministry of Health, departments of the Institute develop model curricula and methods of training for various advanced training courses and for specialization courses at other advanced training institutes.

Conferences held by the Institute on methodological problems and techniques of training are attended by senior staff from other training institutes in the USSR.

Foreign students are welcomed, and are sent either by their governments or through WHO fellowships. In collaboration with WHO, a 9-month training course for senior public health administrators is organized yearly, with 18-20 participants from the USSR and other countries in eastern Europe. International symposia and seminars on various public health subjects are organized by the Institute on behalf of WHO.

The Institute's research activities are intimately bound up with its training work and form part of the State Medical Research Plan. It is chiefly concerned with investigations on the following problems:

(a) cardiovascular diseases; (b) the reduction of incidence of infectious diseases and their eradication; (c) malignant neoplasms and their treatment; (d) the reduction of child mortality; (e) protection of mothers and children; (f) medical radiology; (g) environmental sanitation; and (h) the further training of physicians. The Institute's research laboratories also play an important part in the scientific training programme.

Medical workers may attend the Central Institute for individual or group study in connexion with an investigation they are pursuing, and may take courses in mathematics, statistics, physics, or cybernetics.

Since the Institute has five faculties, is long established, and has been entrusted with the responsibility of developing further training, it has forged close links with the other institutes for advanced medical studies in the USSR and with the ministries of health of the republics of the Union and the autonomous republics.

The Central Institute assists the Ministry of Health of the USSR in co-ordinating the national plan for the development of the trained manpower to operate the health services. It also supplements the training given at the other institutes: where necessary, it can provide training courses at a higher level than the other institutes, and can train their staff.

To illustrate this, the Faculty of Surgery is described here in some detail. This Faculty, under a Dean, has 15 departments. The clinical bases of the departments are the 12 largest Moscow clinical hospitals, the six research institutes of the Academy of Medical Sciences of the USSR and of the Ministries of Health of the USSR and the Russian Soviet Federal Socialist Republic, and a number of other large medical centres and hospitals with a large bed capacity. The teaching staff of the Faculty includes 25 professors, 25 docents, and 82 lecturers.

The Faculty has the following departments: surgery 1; surgery 2; a department affiliated to surgery 2; roentgenology; cardiovascular surgery; therapeutic and orthopaedic stomatology; ophthalmology; urology; otolaryngology; anaesthesiology; neurosurgery; oncology; traumatology; orthopaedics and combined radiation injuries; lung tuberculosis surgery and other lung pathology; proctology course (led by a docent); and operative dentistry and facial restorative surgery.

The total bed capacity of the Faculty is 3000, and all departments are concerned with surgery. A Surgical Board handles educational and scientific problems and approves candidates for instructor vacancies. A Faculty Methodological Board discusses and approves curricula for training courses, material, etc., and acts as an advisory body to the Dean.

Every year more than 2000 persons undergo further training in the Faculty, and at any one time 150 *aspirantura* candidates and 100 clinical *ordinatura* candidates are also receiving training.

The Faculty provides training courses preceded by correspondence work and reading programmes, short-term courses on special subjects, extra-mural courses, and special courses for the heads of surgical departments.

In recent years courses or seminars have been held for growing numbers of heads of departments and docents from medical institutes and from other institutes for advanced medical studies. The Faculty's departments provide local health authorities with considerable methodological, consultative, scientific, and practical assistance.

TASHKENT INSTITUTE FOR ADVANCED MEDICAL STUDIES

From small beginnings in 1932, when it had six Chairs and only three professors with doctorates in medical sciences, the Tashkent Institute has now become one of the leading institutes of its kind in the USSR. It is administered by the Ministry of Health of the USSR, but is closely connected with the Ministry of Health of the Republic. The Minister of Health of the Uzbek SSR was formerly Rector of the Institute and takes a keen interest in its progress. The annual budget is 1.2 million roubles.

The Institute is governed by a Rector and three Pro-Rectors dealing respectively with scientific affairs, academic matters, and administration. It has three faculties: internal medicine, surgery, and sanitation and hygiene. Each faculty is headed by a Dean, and there are 38 departments.

In the Faculty of Internal Medicine there are the following departments: general therapy, emergency therapy, radiology, paediatrics (since there is no faculty of paediatrics), haematology, laboratory diagnosis, psychiatry, pulmonary tuberculosis, child tuberculosis, haemopathology, child haemopathology, dermatology and venereal diseases, and epidemiology. The Faculty of Surgery has Chairs in orthopaedics, traumatology, anaesthesiology (2), obstetrics and gynaecology (2), stomatology, otolaryngology, ophthalmology, oncology, radiology, general surgery (2), and operative surgery. The Faculty of Sanitation and Hygiene has departments of infectious diseases, children's infectious diseases, microbiology, epidemiology, general hygiene, morbid anatomy, social hygiene, the organization of public health services, forensic medicine, and Marxist-Leninist philosophy.

Each faculty has a scientific council, which advises the Dean and deals with such matters as theses and dissertations, and a methodological council. Two general councils in the Institute advise the Rector, and deal respectively with administrative and scientific matters.

Of the 192 teachers, 23 hold the degree of Doctor in Medical Sciences and 109 the degree of Candidate in Medical Sciences. In addition to the 38 professors, there are 46 docents and 108 lecturers. The staff also includes 91 senior technicians and 93 service personnel. The Institute has a central administrative building, but individual departments are located in large city hospitals in Tashkent. It has its own radiological training centre and large laboratories with good equipment.

The Tashkent Institute conducts specialist and further training courses in all the specialties covered by its three faculties. Some 2500-2700 doctors receive training each year, and in 36 years 34 000 doctors have taken courses. In 1968 some 140 courses were conducted.

Generally, the courses offered are as follows:

- (1) specialist courses, usually lasting five months;
- (2) general courses;
- (3) further training courses in specific subjects or groups of subjects;
- (4) specialist or further training on an individual basis;
- (5) extra-mural courses;
- (6) special courses at local hospitals or industrial centres, such as a textile factory or an aeroplane construction plant.

The Institute's work programme is planned on the basis of requirements, taking into account the type of doctors to be trained, their educational background, the frequency with which they must undergo training, and the duration of courses. Each year a time-table is prepared and issued to local authorities, who nominate the doctors who will attend. When the nominations have been approved by the Ministry of Health of Uzbekistan, the doctors are sent enrolment forms and are instructed to report on a certain date. During the course they are provided with an allowance and hostel accommodation. Afterwards they can return to their former posts and salaries.

The Institute trains doctors not only from Uzbekistan, but also from the Kirghiz, Turkmenian and Kazakh Republics of Central Asia, and from oblasts of other republics that border the Caspian Sea.

The curricula may come from the Ministry of Health of the USSR, but some are prepared by the Tashkent Institute. They are discussed by the Methodological Council, and may be modified before they are implemented. Schedules of courses are made out for each half-year.

A strong effort is made to provide for cross-fertilization in specialist teaching. For example, doctors taking courses in internal medicine (therapy) may also study in the departments of laboratory diagnosis, physiotherapy, or tuberculosis, and doctors taking courses in surgery may study in the departments of oncology (cancer), traumatology, or topographical anatomy. Instruction is both theoretical and practical.

Doctors are taught new diagnostic methods and are provided with material for dissertations. At conferences held in the departments the doctors make reports, and the best papers are presented at Institute conferences.

Extra-mural courses are an important part of the Institute's work, and up to 20 are held each year. In 1968, for example, the Paediatrics Department visited Dairy in March, the Surgical Department spent April in the Feyama Valley, and the second Obstetrics and Gynaecology Department spent September and October in the Buhara oblast.

When a department visits a rural area, arrangements are made for its reception at the rayon hospital and working contacts are made with the local doctors and the population. The Institute staff give theoretical and practical instruction, carry out ward rounds, perform operations, hold scientific conferences, give radio lectures, and meet the local press and people. The Institute has a particular interest in extra-mural courses on rheumatology, and conducts the only course on rural toxicology in the USSR. Rural Uzbekistan is a major cotton-growing area, and it is important to safeguard the health of the people from the effect of pesticides.

The Institute provides a consultancy service on unusual cases and in the course of 20 years it has studied 19 400 individual patients. It has sponsored more than 40 scientific conferences, receives travelling scientific societies, and monitors or tests new drugs. It prepares histological specimens for teaching (over 34 000 in 1967).

Research is carried out in such fields as communicable diseases, cardiovascular disease (especially myocardial infarction), rheumatism, and digestive tract pathology.

It is customary for the course for advanced training in surgery to be conducted and supervised by the Central Institute in Moscow, which sends a team of its leading surgeons and teachers to Tashkent. The course is attended by the chief surgeons and department heads in the Tashkent area. In 1967, courses in social hygiene and cybernetics were also given at the Tashkent Institute by staff from the Central Institute in Moscow.

The senior scientists and docents on the Tashkent Institute's staff not already so qualified are working for their Doctorates in Medical Science, and 47 persons are following *aspirantura* programmes. In the last 10 years, 19 members of the Institute's staff have obtained the degree of Doctor in Medical Science, and 120 the degree of Candidate in Medical Science. Staff members have published 57 monographs, over 1000 papers, and 10 editions of collected works.

Since the number of doctors studying at the Institute is constantly increasing, additional space is required. A new construction project

undertaken with the assistance of the Ministry of Health of the USSR will provide hostel accommodation for 632 persons, additional teaching and laboratory facilities, extra library space (the Institute already has 72 000 books), and offices.

FORMS OF TRAINING

Several types of course are used in advanced medical education in the USSR, and some of them reflect a new approach. The principal forms of further training used are discussed below.

TWO-PART COURSES

The Central Institute for Advanced Medical Studies in Moscow has introduced a system of training in two parts:

- (1) A correspondence course, which the trainee undertakes at his place of work, consisting of the study of textbooks supplied by the Institute and of additional recommended literature. The trainee performs a series of written exercises and forwards them to the Institute.
- (2) A short intensive course of instruction at the Institute.

This form of course has now been used for the training of about 20 000 doctors at the Institute, and is considered to have many advantages over the conventional approach. It was first used in 1955, in the Department of Public Health Organization, and was concerned with only one aspect of the subject. By 1960 doctors in some 19 specialties were studying by this method, particularly in the departments of surgery, internal medicine, dermatovenereology, and tuberculosis. In 1965, 3906 doctors took correspondence courses in 58 departments of the Central Institute, and the following year 40 % of all doctors who received training had taken correspondence courses. Many of the Central Institute's departments (e.g., public health organization, industrial hygiene, aviation medicine, communal hygiene, dermatovenereology, tuberculosis, and neurosurgery) conduct all or almost all of their courses in this manner. Within the next few years, 50-60 % of further training will be given in this form.

Experience has shown that, in a correspondence course, the trainee can be presented with an effective instructional programme of theore-

tical material that he can understand. This makes it possible to reduce the period of attendance at the Institute to 4-6 weeks, so lowering costs and enabling a much larger number of trainees to attend without greatly expanding the facilities and staff of the Institute.

Recruitment commences in August and September each year, when advertisements are placed in the medical journal *Medicinskaja Gazeta*. Usually the number of applicants exceeds the number of places available.

A selection committee is set up to decide which applicants shall be accepted. It takes into account such factors as the need to have a homogeneous group, the seniority, posts, and specialties of applicants, and the nature and duration of previous advanced training courses attended. Letters of reference from the local health authority are studied, as are requests for training of their staff from heads of local health services. An applicant who is accepted receives a notice from the Institute, and a copy is sent to the chief of the unit where he works.

Competitive selection induces greater interest on the part of the trainees and enables the Institute to recruit homogeneous and harmonious groups. Nevertheless, it is hoped that the Institute will eventually be able to accept all doctors recommended by their local health authorities.

Through contacts with the trainees during the correspondence section of the course, the staff of the Institute are able to compile a better programme and, when the trainees come to the Institute, to deal with questions that are of interest to them.

Correspondence courses are most effective in the advanced training of senior staff. They are not so successful in specialization courses, since younger doctors have not the experience to pick out what is essential and are lacking in practical skills.

Training by correspondence requires 6-8 hours a week of independent work on the part of the trainee. This takes various forms. From time to time the Institute department sets the trainee an assignment, and at the same time sends him written advice and guide-lines on methodology. Subjects chosen for such assignments are usually theoretical questions related to the specialty, e.g., the description of various clinical syndromes, as well as studies of incidence over a certain period of time. Usually it takes 1-1½ months to carry out one assignment, and the curriculum includes 3-4 assignments. The correspondence section of the course usually lasts 4-6 months.

Every assignment completed and sent in by the trainee is reviewed by the appropriate department. Usually it is sufficient to point out mistakes or discrepancies, or to provide additional explanation on matters that were not clearly understood by the trainee. This review provides an opportunity for personal contact, and enables the teacher to help the trainee and at the same time to assess his progress.

A trainee who successfully fulfils all the assignments in the correspondence section of the course is then summoned to the Central Institute for Advanced Medical Studies for intensive training.

Experience shows that most doctors carry out the correspondence assignments quite well. The volume of each assignment may amount to 20-30 typewritten pages, and the work includes charts, drawings, and tables.

It is important to earmark certain theoretical parts of the course for independent study, for this is much more effective than listening to a lecture on the same material. Trainees receive great help in their independent study from the special lessons or lectures sent with accompanying teaching aids. These lessons deal usually with the more important parts of the course. Some departments send large amounts of reading matter, sometimes up to 2000 pages. Many departments recommend the study of a particular clinical entity, as well as the related laboratory methods. This is especially valuable if the student can supplement the material sent to him with an analysis of his own experience and the results of the treatment used.

The curriculum of the session at the Institute is compiled in the light of the subjects studied in the correspondence course, and is designed so that ample time can be given to laboratory subjects and the study of patients. This Institute session remains the main factor in improving the doctor's knowledge and skill, especially in clinical subjects. The correspondence training cannot replace it, and is most effective when the two are used in combination. The Institute session concentrates mainly on aspects of a subject not dealt with in the correspondence course. The correspondence assignments and the trainees' reports are discussed.

In specialties where the acquisition of technical skills is less important, such as the history of medicine, the organization of public health, and some hygiene subjects, the main part of the curriculum can be covered by correspondence. The session at the Institute need only include the final stages, and may be as short as one month. The Institute sessions in clinical subjects normally last at least two months, although six weeks is sufficient for some of the narrower or more limited specialties.

At the end of the entire course, the results are assessed in an examination or concluding conference. Experience has shown that the final level of knowledge of doctors who undergo these two-part courses is as high as that of doctors who take longer courses at the Institute with no preliminary correspondence training. These combined courses are appreciated by the doctors.

The two-part system of advanced training has some shortcomings. One is the drop-out rate, which in some sanitary and hygiene departments

may be as high as 25-30 %. The main reasons for drop-out are: insufficient or unsatisfactory information on the course; overwork of many doctors in their daily jobs; ill-health; and changes in residence or in the nature of the doctor's work. The longer the correspondence course, and the longer the time between its completion and the beginning of the session at the Institute, the greater is the drop-out of participants.

A second shortcoming of two-part training is the amount of review work and correspondence with participants that has to be undertaken by the Institute staff.

Any further improvement in this method must stem from more efficient independent work by the trainees and a reduction in the teaching time devoted to this work. New ways must be found to assist independent study, such as the introduction of programmed instruction. This has already been done in some departments dealing with physiology, pathology, topographical anatomy, surgery, biochemistry, and some other subjects.

Experience has shown the need for effective organization in correspondence courses. The daily work of the department in its contacts with participants, the punctual despatch of recommended literature, the careful preparation of lectures or presentations, and skill in preparing teaching aids on important aspects of the specialties, all determine the success or failure of correspondence training. It helps considerably if the institute has its own printing service. The success of correspondence training depends also on organization at the trainee's end. Important factors are the right to time off for study, the balance and relationship between correspondence training and sessions at the institute, the mental satisfaction of learning through correspondence courses, and the trainee's personal efficiency in completing tasks.

EXTRA-MURAL COURSES

In 1952, the Central Institute for Advanced Medical Studies began to organize extra-mural courses in various cities in the USSR. For the first few years these advanced training courses were conducted by a few departments only, but since 1961 they have been expanded very greatly and placed on a systematic basis.

By 1968 some 178 extra-mural courses had been held in more than 50 cities in the USSR, and were attended by 7000 doctors. At first they were conducted on the basis of an agreement with the department or departments concerned or in response to requests from regions or cities. Now these courses are an integral part of the Central Institute's work and are included in the programme of the Ministry of Health of the USSR.

An analysis of the results achieved by extra-mural courses was presented at a conference held at the Central Institute in March 1966. It was evident that this is a progressive and economical form of teaching whereby a large number of doctors can be instructed by a small visiting staff and exercises can be conducted under local conditions of work.

Nevertheless, extra-mural courses must be regarded as an auxiliary aid and cannot fully replace courses conducted in the departments of the Central Institute. They are difficult to conduct in narrow and highly specialized fields, because of the lack of facilities at local centres.

Experience gained by the Central Institute has shown that maximum efficiency of extra-mural courses can only be achieved under the following conditions:

- (1) There must be careful preliminary preparation of the programme and schedule of instruction, for which the optimum duration is one month. Participants must be selected carefully and should have backgrounds related to the programme of the course. It is of great importance that the group should be homogeneous as regards interests and basic and specialized training.
- (2) The visiting team must be led by the head of the Institute department concerned or a professor and must consist of highly experienced teachers. It is also possible, after preliminary briefing, to use teachers from local medical institutes and advanced training institutes and the leading specialists of the local health institutions.
- (3) The centre where the course is given should have well-trained doctors and auxiliary medical workers, and good modern equipment.
- (4) In organizing the courses, provision should be made for some lectures, discussions, and conferences that will be of interest not only to the participants but also to doctors in related fields and to public health organizers in the city, kraj, or oblast. Some of the lectures should be planned for the evening and should be advertised in the local medical press.
- (5) Teaching methods should include lectures with visual aids, practical lessons, seminars, question-and-answer sessions, and especially discussions.

The visiting staffs of clinical departments should take part in the daily work of the centre, morning meetings, ward rounds, operations, etc. The information acquired in this way can be used to make the lessons more topical and practical. It is advisable for some departments to issue preliminary material on their methodology, so as to improve the actual teaching process at the course. This material can later be used as an aid for local medical colleges and institutes for advanced medical studies.

The visits of teams of specialists from the Central Institute can be used to advantage not only for teaching, but also for consultation on the organization of local establishments, the diagnosis and treatment of patients, the selection of subjects for research, and the techniques of investigation. Moreover, recommendations made by visiting teams to the local health authority carry considerable weight. These courses have established firm links between the Central Institute for Advanced Medical Studies at Moscow and a large number of cities, oblasts, krajs, and individual medical establishments.

The course ends with a conference to discuss the results achieved. This conference also provides an opportunity for informing participants of the work of the Central Institute.

In specialist extra-mural courses, programmed instruction can be used. This method of teaching permits a larger number of trainees to be enrolled and improves their clinical reasoning.

Clinical departments conducting extra-mural courses use questionnaires, and set specific tasks concerned with the clinical condition, differential diagnosis, and treatment of various diseases.

An additional benefit of extra-mural courses is that teachers, by becoming acquainted with conditions of work and other features of peripheral hospitals, and by comparing notes on various aspects of the work, broaden their outlook and improve their teaching ability.

FULL-TIME COURSES FOR SPECIALISTS

The courses for which the trainee leaves his place of work and attends an institute as a full-time student are still the most popular. These courses may be either general, covering a specialty in a broad way, or specialized, dealing with some particular aspect of a specialty.

The general courses are intended mainly for specialists with 5-7 years' seniority. For those undertaking such courses for the first time, the duration is usually 4-5 months. The specialized further training courses deal with selected questions of importance in a specialty, and with particular new advances or aspects on which physicians in practice require more knowledge or expertise. These courses are intended for more experienced specialists of at least 10 years' seniority.

However, although attendances are still large, these full-time courses are gradually being replaced by the combined correspondence and Institute courses.

INDIVIDUAL TRAINING

A doctor who wishes to perfect himself in some aspects of his work may take an individual training course at an institute for advanced

medical studies. Such studies usually relate to some narrow field. The doctor spends 1-2 months in one of the institute's departments, taking part in its work and mastering some new operative or diagnostic technique. Another form of individual training is the clinical *ordinatura* system, described on p. 20.

INTERMITTENT COURSES

Another form of further training for both individuals and groups is the intermittent course. These courses are organized for doctors within easy reach of an institute for advanced medical studies. They may combine 1-2 sessions a week of lectures or conferences with individual work or a correspondence course. The trainees can conduct independent work on literature and may study in clinics or institutes. They need not leave their place of work and can study topics or problems that are of concern to them as individuals.

INFORMATION SERVICES

Apart from the various types of courses, information services enable doctors to keep abreast of new developments.

The All-Union Scientific Research Institute of Medical and Medico-technical Information was founded in 1963. With the assistance of senior specialists from Moscow and Leningrad establishments for scientific research and higher education, this Institute edits and publishes scientific reviews and thematic abstracts compiled after study of published material. The Institute has organized a system for the individual and collective supply of information for scientists, medical practitioners, and scientific institutions. It publishes a monthly list of articles in foreign medical journals. Scientists, doctors, and administrators place great reliance on its publication *News on Medicine and Medical Techniques*. A micro-filming service for foreign medical publications is available to scientific institutions and higher educational establishments.

A monthly *Medical Review*, launched in 1969, is published in 16 sections, covers 38 medical scientific subjects, and is widely available. *Express Information*, another monthly publication, covers 10 branches of medicine: cardiovascular diseases, rheumatology, haematology and blood transfusions, oncology, surgery, virology and virus infections, the side-effects of certain drugs, psychopharmacology, general immunology, and medical instruments and equipment.

Each year the Institute of Medical Information processes for bibliographic purposes 90 000 articles dealing with 82 branches of medicine,

using data from foreign journals and monographs. It publishes other reviews and abstracts all Soviet medical literature.

In order to provide an information service available to all medical scientific workers the Institute has established a unified All-Union reference system, with branches and funds, that is available in the republics, scientific research institutions, higher educational establishments, and therapeutic-preventive establishments.

ADVANCED TRAINING OF SPECIAL GROUPS

MEDICAL TEACHING STAFF

The further education of the teaching staff of medical institutes and other professional educators has become an important feature of the work of the Central Institute for Advanced Medical Studies.

The first steps were taken in 1936, when the Faculty of Sanitation and Hygiene organized 10-day courses for 113 teachers from institutes of sanitation and hygiene. In 1941 the Second World War made it necessary to train instructors in military epidemiology, sanitation, and defence against chemical weapons. Such training continued throughout the war, and 188 teachers in these specialties were trained. In the post-war years, the training of teachers in medical institutes became important, and courses were organized in biology, physiology, and pathology, for the heads of the relevant departments. In 1952 the Central Institute organized eight courses on the physiology of the higher nervous system, based on the teaching of I. V. Pavlov, for teachers from departments of pharmacology, pathophysiology, paediatrics, surgery, internal medicine, physical medicine, and infectious diseases. A total of 267 teachers attended these courses.

This work has grown to such an extent that by 1965 some 3400 professors and teachers from medical institutes had attended further training courses at the Institute. In 1965 and 1966 almost 2000 teachers and members of scientific and research institutes attended 91 courses, seminars and symposia. In 1967, 1434 heads of departments, teachers in medical institutes, and workers from research and other institutes received training. Forty Institute departments participated, and a large amount of knowledge and experience of this work has been accumulated.

The training of medical teachers now takes three main forms:

General refresher training

This form of training is mainly concerned with new developments in scientific fields and with the acquisition of knowledge on new techniques.

For example, courses on biology that emphasize genetics are given to teachers in clinical departments, courses on experimental genetics to teachers in theoretical departments. Physiology teachers receive instruction in biophysics, and psychiatrists in psychology. These are essentially "refresher" courses that aim to improve the general level of teaching. They require continuity in teaching and consist of a combination of lectures and practical instruction. About 50 % of the time may be devoted to lectures. Considerable attention is also paid to the methodology of teaching, the philosophy of teaching, and political philosophy. The courses last 1-2 months, and the participants usually include heads of departments.

Advanced training courses in specialized fields are held for professors and teachers, and are somewhat similar to those described above. Their aim is to improve teaching in a specific new subject or field of advance. There have been courses on oncology and proctology for docents of surgical departments, courses for professors working in occupational pathology, courses on endocrinology and nutrition for teachers of internal medicine, and courses on virology for teachers of microbiology. The usual duration of these courses is again 1-2 months.

Since many of the subjects taught in these courses lie in the fields of research covered by the higher educational or research centres in Moscow, teachers and scientists from these institutions collaborate in the teaching.

Methodological seminars are included in this form of training. They are more practical, have less theoretical content, and are mainly devoted to the teaching of new techniques. They include courses in health statistics for teachers of hygiene, the use of radioactive isotopes in experiments, and new operative methods to improve hearing for teachers of otolaryngology. The duration of these courses is usually one month.

Seminars to improve teaching skills

During the last 3-4 years the Central Institute has developed a programme for improving the teaching skills of professors and teachers. Seminars for this purpose are held by all the Institute's faculties and cover nearly all specialties.

The programmes of these seminars differ in many ways from those of other courses already described. They are divided into sections, which vary in content from one subject to another, but the main section is always the methodology of teaching. This is the most difficult section to teach and shows the most variation in approach. Most departments conduct this part of the course through lectures and by practical demonstrations at corresponding departments in the medical institutes. This

is done partly in order to share experience, but partly because the teachers in medical institutes are felt to have better teaching methods than those in the Central Institute for Advanced Medical Studies. However, this procedure has not had the success that might be expected. The trainees, themselves senior teachers, react critically to lecturers who overdo the presentations, and resent showmanship or other displays.

The Medical Didactics Chair created in 1967 at the Central Institute met a deeply felt need, for medical teachers not only at the Institute, but throughout the country, lack training in teaching methods. Their methods have been developed either spontaneously or by consciously or unconsciously copying their own teachers or others whose teaching they admire.

A second section of the programmes to improve teaching skills is concerned with "chosen specialty questions". There are two approaches to this. One is "multi-subject", where the staff of the department decide on a number of topics and prepare lectures and demonstrations, followed by discussions. Shortcomings of this approach have been pointed out by participants: the courses are so overloaded that time is usually too short for effective study of the subjects in depth, or for study of the methodology of teaching. Experience is tending to favour a "single-subject" or problem-oriented course. This enables a deeper study of the question to be made, and greater co-operation can be secured from experts in the field, from outside the Central Institute. This approach makes for more lively and more fruitful discussions.

The third section of these courses is concerned with improving the teachers' theoretical knowledge. This is done by the Central Institute's staff, and coverage is given to subjects that raise important problems in teaching, such as genetics, heredity, biological compatibility of tissues, and bionomics.

Visits to the leading scientific centres are always included as part of the course; these should be closely related to the subjects taught. Again, it is important for participants to familiarize themselves with new medical or research equipment.

An important feature of seminars such as these is the discussion of scientific questions of interest to the participants, many of whom may be engaged in preparing doctoral theses and all of whom are interested in research. Three approaches are used: (1) the reading of scientific reports by participants; (2) discussion of the theme of a dissertation; and (3) consultations with the teaching staff of the Central Institute. A combination of these approaches is usual, and one day a week is set aside for such topics. Time should be available for work in the library.

The above description shows the variety of forms these seminars may take. Other important considerations are the duration of the seminar

and the composition of participating groups. The optimum duration is one month, preferably during academic vacations. The most successful seminars have been those for heads of departments, particularly those with extensive teaching experience and responsibilities.

Seminars involving study of methodological questions

Seminars of this type started in 1965, when the Central Institute was appointed the methodological centre for the further training and specialization of doctors. The only such seminar held in 1965 was in tuberculosis. In 1966 the number increased to four, in the Departments of Morbid Anatomy, Morbid Physiology, and Paediatrics, and the following year 12 such seminars were held.

Various lessons were learnt in conducting these seminars:

- (1) The duration of the seminars, usually 7-10 days, was found to be too brief.
- (2) There is a need to concentrate on educational and methodological matters and to avoid specifically medical questions.
- (3) Seminars should be related to practical matters, such as teaching programmes and their unification, the integration of theoretical and practical instruction, the amount and form of practical skills to be taught, and discussions on the methods of conducting lectures and practical lessons.

For one seminar, the Department of Tuberculosis prepared well ahead of time a draft programme of the general and specialized training courses planned. This was discussed very thoroughly at the seminar, and as a result a single programme was formulated for the whole system of further training and specialization in tuberculosis to be employed at institutes for advanced medical studies and at medical institutes throughout the Soviet Union. Methodological questions were also discussed.

At other seminars the Departments of Morbid Anatomy and Morbid Physiology worked out patterns for symposia that will serve not only as programme documents for work in the next few years, but also to consolidate the theoretical part of the general system of further training of doctors.

A number of problems have been encountered, such as the difficulty of securing homogeneous groups and of persuading those who lack interest to attend, but it is considered that all senior teachers should attend at least one seminar every three years.

Further development of the training of medical teachers is being planned by the Central Institute for Advanced Medical Studies.

PUBLIC HEALTH ADMINISTRATORS

The public health organizer in the USSR, as in most eastern European countries, is a specialist corresponding in function to the hospital administrator and public health officer in western Europe.

The post-diploma training of public health organizers or administrators in the USSR is based on studies of their professional activities and is carried out at institutes for advanced medical studies in the form of full-time courses, combined correspondence and full-time courses, and extra-mural courses.

The programmes of general courses for increasing the skills of public health organizers may vary in relation to the needs of the participants, but all contain the following sections:

- (1) special topics on social sciences and the history of public health services;
- (2) the theoretical and organizational fundamentals of public health services, with an outline of the elements of social hygiene, theory of public health services, medical legislation, the fundamentals and methods of administration, planning, and financing of the public health services;
- (3) the organization of therapeutic and preventive aid, with a study of such aid in cities and rural localities; organization of medical services for workers in industrial enterprises, examination of questions related to disability, and the organization of specialized aid;
- (4) the organization of sanitary and epidemiological control work and health education.

The coverage of these sections varies according to whether the courses are general or are devoted to a particular topic. In the general courses for leading public health personnel, for instance, questions concerned with the organization of medical services account for 40 % of the study time, and of this only 25 % is devoted to the protection of mothers and children. At courses concerned specifically with maternal and child health, on the other hand, 65 % of all the study time is allocated to the organization of medical services for mothers and children. The rest of the material in the programme is presented in as compact a form as possible, and is dealt with in the context of the main topic of the course.

The Central Institute for Advanced Medical Studies trains public health organizers not only for the republics of the Soviet Union, but for other countries as well. For example, it holds the Moscow WHO International Courses for Public Health Administrators, so named because WHO provides a proportion of the participants with fellowships. The participants are trained public health officers: heads of public health boards and departments, chiefs of oblast and rayon health departments,

chief physicians of hospitals, representatives of social hygiene departments and public health organizations. The aims of the course are to provide a background for a detailed theoretical study of administrative questions, to teach quantitative and qualitative methods of statistical analysis, and to study the theory and practice of medical services in different countries.

Lectures are given not only by teachers at the Central Institute itself, but also by teachers of scientific and practical institutions of the USSR Ministry of Health, the Academy of Medical Sciences of the USSR, and heads of public health schools abroad. The programme of the course, which covers a period of 9 months or 900 academic hours, includes (a) medico-social services for the population; (b) medical statistics; (c) design, architecture, and construction of medical establishments; (d) sanitary and hygiene services; (e) education and training of medical personnel; (f) current achievements in medical science; and (g) a study tour of two countries in eastern Europe.

The results of the work are summed up on completion of the programme. At the beginning of the course, topics are determined for papers to be prepared by the participants. Preparation of these papers requires regular and systematic work throughout the entire period, and involves individual study of literature, work on the participant's own research data, and collaboration with consultants and the course teachers assigned to each participant according to his research topic.

In most cases, topics are determined according to the interests of the participant, the possibility of his continuing to carry on his own research, and investigations started before the course.

PARAMEDICAL PERSONNEL

While the further training of paramedical personnel has not been developed to the same extent as that of physicians, all oblast administrations have arrangements that provide for refresher courses for feldshers, midwives, and nurses. Training is less formal than for physicians, and usually consists of short courses at local medical centres. The training is to be developed further, and a recent ordinance issued by the USSR Ministry of Health stipulates that a compulsory course shall be provided for each person every 3-5 years and enjoins all personnel to improve their knowledge and skill. In Uzbekistan, 60 courses for paramedical personnel were held in 1968, but these were individual oblast efforts on a small scale. Participants are sent by their local health authorities.

Paramedical personnel may go on to specialize further in their fields. This applies mainly to feldshers and nurses who have had complete

secondary education. In Uzbekistan, for example, courses started in 1967 are now well organized and paramedical personnel are receiving training in 30 specialties. Such training is open to personnel with one year of experience and is given in most cities and even in rural centres. Most courses are of five months' duration, but some special courses may last two years. Some 1200 nurses and feldshers had courses in 1968, and it is expected that the number will reach 1870 in 1969. Certificates are granted to successful participants, and courses count towards promotion.

An important aspect of this programme is the opportunity afforded to all paramedical personnel to undertake medical training and to qualify as physicians. If a feldsher or other student in an intermediate-level training course secures excellent marks, he or she can start professional medical studies immediately. For others, at least three years' field experience is necessary before commencing medical training. Where necessary, personnel are offered opportunities to improve their standard of secondary education before entering an institute. About 5 % of all paramedical personnel continue their training and become physicians.

Annex 1

LIST OF PARTICIPANTS

- Dr M. el H. Abu Bakr, Consultant Physician, Civil Hospital, Omdurman, Sudan
Dr S. Ahari, Chief, Surgical Department, and Director, Firuzgar Medical Centre, Teheran, Iran
Dr I. G. Badran, Professor of Surgery, Faculty of Medicine, Cairo University, United Arab Republic
Dr P. Dolgor, Dean, Faculty of Postgraduate Training, State Medical Institute, Ulan Bator, Mongolia
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Dr T. Kádár, Director, Postgraduate Medical Training Institute, Budapest, Hungary
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Dr J. de Leon, Dean, Faculty of Medicine, San Carlos University, Guatemala
Dr M. Leon, Director, School of Public Health, Lima, Peru
Dr S. Obradov, Lecturer in Internal Medicine, Medical Faculty, Sarajevo, Yugoslavia
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Dr L. D. Ponce, Dean, Faculty of Medicine, University of Oriente, Sabana Grande, Caracas, Venezuela
Dr J. del Rey Calero, Professor of Hygiene and Preventive Medicine, Medical School, Cádiz, Spain
Dr G. R. Roashan, Research and Training Officer, Statistics and Epidemiology Section, Institute of Public Health, Kabul, Afghanistan
Dr H. C. B. Tomassini, Head, Epidemiology Department, School of Public Health, Rio de Janeiro, Brazil
Dr B. Vachananda, Lecturer in Anatomy and Secretary to the Faculty, Faculty of Medicine at Siriraj Hospital, University of Medical Sciences, Dhonburi, Thailand

WHO Secretariat

- Dr V. N. Butrov, Vice-Rector, Central Institute for Advanced Medical Studies, Moscow (*Consultant*)
Dr J. Deeny, Dunkeld, Portmarnock, Co. Dublin, Ireland (*Consultant*)

Annex 2

LIST OF PRINCIPAL INSTITUTIONS VISITED

- Moscow* Central Institute for Advanced Medical Studies, including visits to the
 Department of Internal Medicine and the Radiology Department
 Second Moscow State Medical Institute, including a visit to the Bio-
 medical Faculty
 First Moscow State Medical Institute
 Lumumba People's Friendship University
- Tashkent* Institute for Advanced Medical Studies
 City Hospitals No. 15 and 16
 Tashkent State Medical School
 Institute of Radiology and Oncology
 A Republic Eye Hospital
 A Maternal and Child Health Centre
 A Feldsher-Midwifery School
 A Children's Hospital
 Maternity Home No. 9
 A rural hospital near Tashkent
- Samarkand* Samarkand State Medical Institute
- Sukhumi* Medical Biology Centre (specializing in monkey-breeding)
 A Republic Hospital used as a centre for the further training of medical
 personnel
 A Sanatorium
 Sukhumi Medical School

Annex 3

SPECIMEN SYLLABUSES OF FURTHER TRAINING COURSES
FOR MEDICAL PRACTITIONERS AND TEACHERS
IN THE USSR

TABLE 1. ONE-MONTH EXTRA-MURAL COURSE FOR
OBSTETRICIAN-GYNAECOLOGISTS

Subject	Hours		
	Lectures	Practical	Total
<i>Obstetrics</i>			
Practical work with phantoms	—	24	24
Toxaemias of pregnancy	4	6	10
Haemorrhage	4	6	10
The narrow pelvis; birth injuries	6	6	12
Extragenital diseases and pregnancy	4	4	8
Postpartum diseases	—	4	4
Perinatal protection of the foetus; toxoplasmosis	4	4	8
The role of women's advisory clinics in the prevention of disorders of pregnancy and childbirth	—	6	6
<i>Gynaecology</i>			
Symptoms and signs of gynaecological diseases	—	2	2
Physiology and pathology of the menstrual cycle	6	4	10
Pre-operative preparation of patients	2	2	4
Pre-tumoral conditions	2	4	6
Tumours	4	4	8
Neoplasms of the female genital tract and pregnancy	2	4	6
Inflammatory diseases of the female genital tract	4	6	10
Infertile marriage	2	4	6
Modern means of contraception	2	2	4
Post-operative care; prevention of complications	—	4	4
Modern anaesthesiology	2	4	6
Colposcopy; new methods of gynaecological examination	2	6	8
TOTAL	50	106	156

TABLE 2. ONE-MONTH SEMINAR FOR THE HEADS OF DEPARTMENTS
OF TOPOGRAPHICAL ANATOMY AND OPERATIVE SURGERY
IN MEDICAL INSTITUTES

<i>Subject</i>	<i>Hours</i>		
	<i>Lectures</i>	<i>Seminars and con- ferences</i>	<i>Total</i>
Philosophical aspects of biology and medicine; genetics in biology and medical practice . . .	4	—	4
General questions of clinical anatomy, morpho- logy and operative surgery	14	—	14
Selected questions of clinical anatomy and opera- tive surgery	56	40	96
Content and methods of the teaching of topo- graphical anatomy and operative surgery in medical institutes	—	18	18
Modern scientific trends in the selection of topics in departments of topographical anatomy and operative surgery	—	12	12
Individual planned study	—	12	12
TOTAL	74	82	156

TABLE 3. SIX-WEEK SYMPOSIUM FOR HEADS OF DEPARTMENTS OF MICROBIOLOGY IN MEDICAL INSTITUTES

Subject	Hours		
	Lectures	Practical	Total
<i>Microbiology</i>			
Comparative characteristics of methods of microscopy	8	12	20
Antibiotics and biologically active substances of natural origin; methods of determining the susceptibility of micro-organisms to antibiotics	12	—	12
Modern concepts of bacterial structure	2	—	2
Biochemical methods of studying cellular structures	2	—	2
Some aspects of bacterial genetics	4	—	4
Bacteriophage as a genetic system	2	—	2
The morphology of immunogenesis	2	—	2
The pathophysiology of immunological reactivity (allergy)	2	—	2
New data on the phagocytosis problem	2	—	2
Mycoplasmataceae	2	—	2
Topical problems in the laboratory diagnosis of bacterial intestinal infections	4	—	4
The laboratory diagnosis of whooping cough	2	4	6
Particularly dangerous infections	4	10	14
The laboratory diagnosis of candidiasis	2	4	6
Some aspects of sanitary bacteriological examination of water, air, soil, and foodstuffs	4	—	4
Toxoplasmosis	2	4	6
<i>Virology</i>			
The nature of viruses	8	—	8
Virus-cell interrelationships	2	—	2
Pathogenesis and immunity in virus infections	2	—	2
Respiratory viruses	4	—	4
Enteroviruses	4	—	4
Arboviruses	2	—	2
Methods of investigation	2	80	82
<i>Selected topics in epidemiology</i>	10	—	10
<i>Teaching methods</i>	—	12	12
<i>Individual planned study</i>	—	18	18
TOTAL	90	144	234

TABLE 4. SEMINAR FOR TEACHERS IN DEPARTMENTS OF SOCIAL HYGIENE AND PUBLIC HEALTH ADMINISTRATION

Subject	Hours		
	Lectures	Practical	Total
The teaching of social hygiene as a science . . .	10	4	14
Social problems of human physiology and pathology	35	—	35
Some problems in organizing medical care for the population	20	9	29
TOTAL	65	13	78

TABLE 5. TWO-MONTH COURSE ON PAEDIATRICS FOR THE HEADS OF CHILDREN'S DEPARTMENTS IN REPUBLIC, KRAJ, OBLAST, AND CITY HOSPITALS

Subject	Hours		
	Lectures	Practical	Total
The main problems in the training and nutrition of children; organization of hospital care and medical statistics	14	12	26
Clinical features of diseases of young and older children, including diseases of the nervous and endocrine systems and the diagnosis of surgical diseases	98	158	256
Acute infectious diseases in children	10	20	30
TOTAL	122	190	312

TABLE 6. TWO-PART COURSE FOR DOCTORS ON CLINICAL ENDOCRINOLOGY

A. Correspondence section (duration: six months)

Subject	Hours (approx.)
Study of the specialist literature	144
Performance of three assignments	40
Examination of patients and the compilation of two case histories	40
TOTAL	224

B. Full-time institute section (duration: two months)

Subject	Hours		
	Lectures	Practical	Total
Morphology and histology of the glands of internal secretion	10	—	10
Pathophysiology of the glands of internal secretion	10	—	10
Chemistry and biochemistry of hormones	6	6	12
Clinical features of endocrine diseases	100	180	280
TOTAL	126	186	312

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